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Forests and People

Our forest land is part of the future. What we do now to our land affects trees, birds, animals, plants, and all living things in the forest for more than a generation.

It affects whoever may own the land in the future - our children, grandchildren, or someone we have never met. It affects our neighbors and the local community. By taking care of our land now, we can ensure a healthy forest for future generations of all living things. The future of the forest is in our hands now.



Forests and People

This publication provides an overview of portions of the Forest Stewardship Planning Guide. It is one of a group of computer programs intended to promote good forest stewardship. It is being developed by the U.S. Department of Agriculture, Forest Service, Northeastern Research Station, Aiken Forestry Sciences Laboratory in Burlington, VT. NED will provide site-specific analyses of management alternatives and expert recommendations to improve management of multiple values on forests in the eastern United States.

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Establishing long-term plans for your forested property is a positive first step toward good forest stewardship. An appropriate management plan considers your needs and desires and helps you achieve them.

Conversations with forest landowners have revealed some interesting stories about their likes and dislikes in the forest. Seeing big, healthy trees, animals, and wildlife habitat are among the “likes”; seeing and walking past dead trees or fresh cut stumps and branches are among the “dislikes”.

What’s so interesting about that? Read on. This booklet will introduce you to the attributes of the forest’s visual qualities and wildlife habitat, and the silvicultural systems that can help you create and maintain these desired forest benefits. You will learn how these can complement each other through wise planning and a little patience.



Visual Quality

Much of the enjoyment we receive from being in the forest comes from what we see and how it makes us feel. Think about why you like your forest. Think specifically about what you enjoy and appreciate.

Are you interested in hiking, trail biking, backpacking, camping, picnicking, and identifying wildflowers because of the visual and scenic qualities of the forest? Do you like to see big trees, sunny areas, cool, shady areas, a pond, or a meadow?

You can incorporate these interests into your forest plans. Presented below are just some of the visual attributes of forests you may want to consider.

The canopy Some areas of your forest could have trees that are about the same height. The tallest trees have branches that interweave to form a dense or closed narrow band of foliage at the top of the trees. These areas have an open, park-like appearance. Other areas could have trees that vary greatly in height. Here, the crowns of the tall trees are farther apart and the upper part of the canopy may be open with crowns of smaller trees below them. The crowns of the smaller trees may be as low as ground level. With this dispersion of foliage from low to high, your view through the forest may be limited.

BIG trees Most of us like big trees in the forest because it gives us the feeling that the forest is old and well established. The big trunks look like pillars holding up the ceiling of a very interesting room. Generally, the big trees are more noticeable when the surrounding trees are considerably smaller. Also, the larger the big trees, the fewer you may need for them to be noticeable.

Fields, meadows, or other land openings These openings provide a warm, sunny place where you can see the sky and open land. If you have a field, meadow, pasture, abandoned orchard, or other terrestrial opening, you can preserve the opening as it is now, or you can let nature take its course. If left alone for many decades, the opening will gradually convert to a forest community. Also, you may choose to create a new opening or change the shape of an existing opening to better serve your interests.



Visual disturbance and slash Visual disturbance is the unsightly look of tall stumps, unused branches, and small trees that have been pulled over, and soil exposed when trees are dragged out of the woods. The visual effects of disturbance and slash can be minimized by working closely with loggers and treating the slash. Slash can be chipped, lopped, burned, removed, or left where it falls. Slash can be treated so it is below your knees, or put into small piles so you can move around easily (rather than climbing over branches and trunks). Some silvicultural treatments create a lot of slash, others create much less. Just remember, most of the signs of disturbance and the slash become much less noticeable a few years after the treatment.

Special plant characteristics You can make changes to the way a forested area, an edge of a forest, a meadow, or a pond looks. Color, flowers, or plants of different shapes and sizes add visual interest. Adding new plants or emphasizing interesting plants that are already established is easy to do.

Wildlife Habitat

Are you interested in photographing or watching wildlife? Hunting? Providing a place for wild animals to live? This information is about habitat features and how they provide desirable conditions for wildlife.

The occurrence and distribution of many wildlife species in the Northeast are related to the following habitat features. Most combinations of these features can be accommodated in your plans.

Mast and fruit Hard mast refers to the nuts and acorns produced by trees and shrubs, especially oaks, beech, hazel, butternut, and hickories. Seeds of other trees, like maple and ash, also serve as food for animals. Fleshy fruits, or soft mast are produced by Mountain ash, blueberries, raspberries, and blackberries. Abundance of hard mast, seeds, and fleshy fruits throughout the year increases survival rates of many wildlife species.


Forest floor Forest litter, duff, moss, lichens, and rocks found on the forest floor provide foraging and shelter sites for many wildlife species. Logs, stumps, and slash all eventually become part of the forest floor, and contribute to this wildlife habitat.

Ground vegetation This layer includes forbs, grasses, other non-woody plants and woody seedlings less than 2-foot tall in forested and nonforested areas. Wildlife species use this vegetation for foraging, cover, or nesting.

Shrub The shrub layer includes the deciduous, coniferous, and ericaceous shrubs and tree seedlings more than 2-feet tall in forested and nonforested areas. Wildlife use this shrub layer for foraging, nesting, or hiding.

Midstory vegetation This layer includes trees and large shrubs taller than 10 feet but below the overstory canopy. Many wildlife species use this layer to nest and forage.

Overstory canopy Some wildlife make use of the crowns of large trees, or overstory canopy, for foraging, nesting habitat, and shelter. Canopy conditions may range from a few scattered trees to dense cover with little sunlight shining through. Many wildlife species require large areas with overstory canopy to survive; others are adapted to live along edges of forests, as in areas with young trees whose crowns remain close to the ground.



Slash Though unsightly to many people, piles of woody debris, or slash, left after a silvicultural treatment provide hiding cover and dens for amphibians, reptiles, and small mammals. Larger mammals such as bear may also use slash piles for protection from the weather. Further, many species of birds use slash piles for nesting. Dead and down woody debris not piled provides wildlife with escape routes and low perches. As the larger woody pieces rot, they support fungi and other plants that some animals use as food.

Woods roads Roads covered with grasses and other non-woody plants provide travel and escape routes, nesting sites, and food including a variety of insects for wildlife species ranging from ruffed grouse, wild turkey, and broad-winged hawks to snakes and turtles to deer and bears. They serve as good places to observe animals.

Nonforest cover types Fields, open wetlands, and other non-forested habitats are an integral part of the Northeastern landscape. These habitats are necessary for almost 22% of the wildlife species found in the region and seasonally important to another 70%. The presence or absence of these habitats and water to a considerable extent determine the degree of wildlife habitat diversity found in a given area.

Special features Streams, ponds, cliffs, caves, and even derelict buildings are important to many wildlife species. Their value to wildlife depends on the surrounding or adjacent forest or nonforest condition. Yet they all contribute some measure of diversity to the habitats in a forest.

Silviculture

A silvicultural system is a planned process for tending immature trees and establishing new trees in forests. It is also used to guide cutting in stands. Silvicultural plans are developed to enhance forest benefits including visual and scenic qualities, wildlife habitat, ecological aspects, water quality and quantity, wood production, and recreation enjoyment.

Each of these silvicultural systems provides the framework for maintaining healthy forest communities over very long periods of time. An appropriate silvicultural system can create and maintain a particular set of desired forest benefits that you identify.

We often think of forests as quiet places that never change. But forests are continually changing - even when we do not disturb them in any way. A young forest changes rapidly. In older forests, changes are so subtle that they are often not noticed from one year to the next.

Single-tree selection This system removes single trees dispersed throughout the forest. It is associated with uneven-aged stands; those that have a mix of trees of different ages. Every 10 to 25 years, some trees of all sizes, or ages, are removed. Small openings are created for the establishment of new trees. Also, by removing some of the trees, nutrients and growing space are available to the remaining trees.

Group selection With this system small groups of trees covering one-fifth to one-half an acre are removed to create an opening. The openings provide conditions for the establishment of new trees. Between the openings, the cutting will also remove scattered individual trees to thin the rest of the forest, and promote the growth of the trees remaining. Repeated application of this system creates groups of trees of the different ages, dispersed throughout a stand. Due to the locations and sizes of the groups, each of the age classes occupies a similar amount of space in the stand.

Shelterwood This system creates stands where all the trees are about the same age. Generally one-half to two-thirds of the mature trees are removed. This lightens the understory, but leaves a reserve of tall trees to serve as a source of seed and to partially shade the ground. New trees become established from their seeds. Then another cutting removes the remaining older trees when the new trees reach heights of 5-10 feet.

Seed-tree and clearcutting These systems create stands where all the trees are about the same age. The seed-tree method removes all but a handful of widely scattered mature trees, and these provide seeds for the new trees. A second cutting removes all of the mature trees when new trees reach heights of 5-10 feet. Clear-cutting removes all the older trees at one time providing an open environment for a new age class to become established and grow.



Now Let's Put These Three Together . . .

Hopefully, you have gained some insight into the opportunities to enhance what you like about your forest and the important contributions of some of the things you may dislike. You are now ready to begin planning.

You may want to start your planning process by walking through your forest and looking carefully at the surroundings. Ask what benefits they provide? How important are they to you? What do you enjoy about them?

Consider these questions:

- Do you have a stream, spring, or pond?
- Are the trees different along the water?
- Do you like this area?
- Where does the sun come through the canopy?
- Do you like bright areas or shady areas?
- Why are there gaps in the canopy?
- Are the crowns of the trees thick?
- Do the trees look healthy?
- What kind of trees are they?
- Are the trees far apart or close together?
- Are they big or small?
- Are big and small trees in separate places or intermixed?
- Where do you hear birds?
- Where do you see them?
- Do you see big dead trees with nests?
- Do you see trees that have nuts or berries?

The graphs and text on the following pages illustrate how forest visual qualities and wildlife habitat are affected by the application of different silvicultural systems.

Planning will help you know when you can achieve a set of goals on the same piece of land and within a short period of time, or when it is necessary to adjust a treatment, wait a little longer, or plan for the goals on separate areas within your forest.

The seven silvicultural systems are grouped into uneven-aged and even-aged systems. We will look at all of these over a 100-year period. The 100 years represent a typical length of time for one even-aged rotation and about the lifespan of an individual tree in an uneven-aged stand.



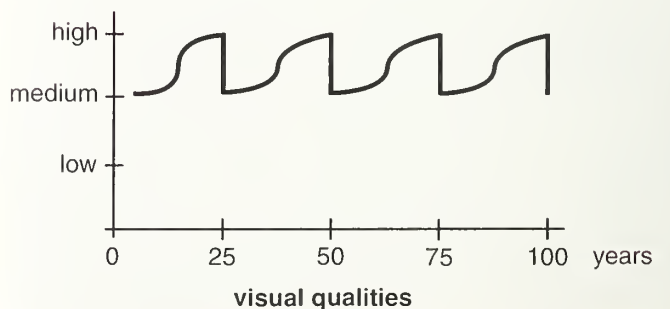
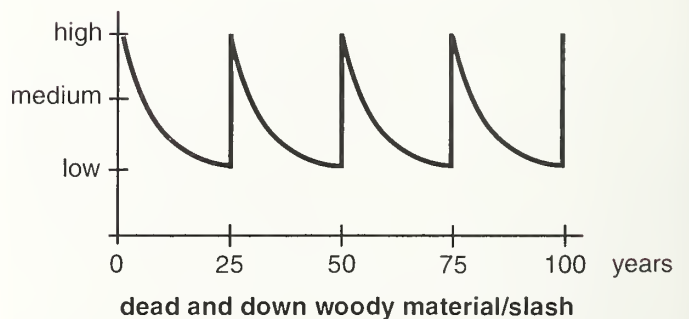
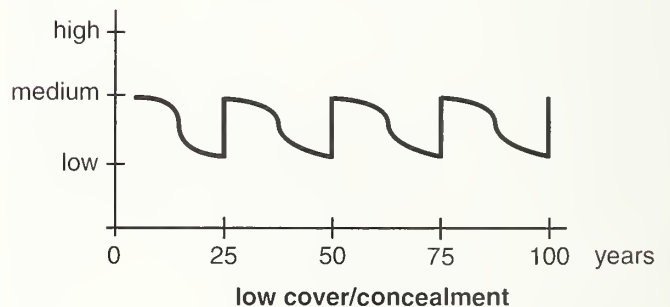
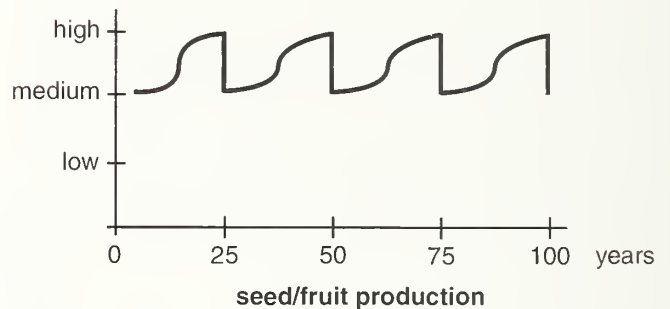
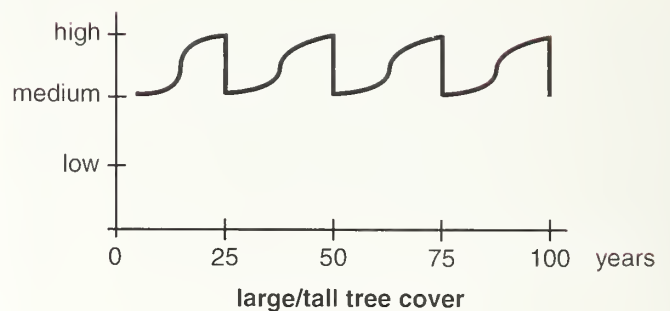
Uneven-aged Systems

An uneven-aged silvicultural system is a planned sequence of treatments designed to maintain and regenerate a stand where trees of three or more age classes will always be present. Uneven-aged systems include single-tree selection and group selection.

Because the sizes of the trees are related to their ages, you will see a mixture of trees of all different sizes when walking through an uneven-aged forest. Leaves and branches from trees, seedlings, shrubs, and herbs may filter your view in the forest, from ground level to the top of the tallest trees. A treatment will create openings in the canopy where trees have been removed. However, there will always be a canopy overhead from the trees remaining.

Specific trees or groups of trees are selected for removal in uneven-aged silvicultural systems. Their selection is based on a combination of criteria including size, quality, spacing, and species composition. The same criteria will be applied in thinning out the trees that will remain. These treatments occur every 10 to 25 years.

The graphs on the right illustrate the ebb and flow of visual quality and wildlife habitat attributes over the course of several treatments. Because of the balance of age classes of the uneven-aged systems, most of these experience subtle changes and return to a high level relatively quickly. Notice that high levels for some attributes will occur at the same time as low levels for other attributes. For example, immediately after treatments there are higher levels of dead and down woody materials/slash, which is desirable for wildlife habitat. However, because of the increased quantity of this material the visual quality is reduced.



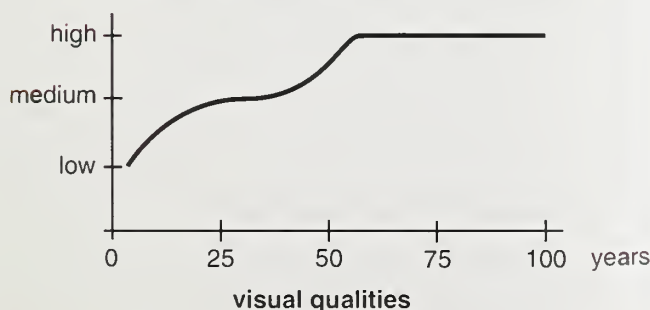
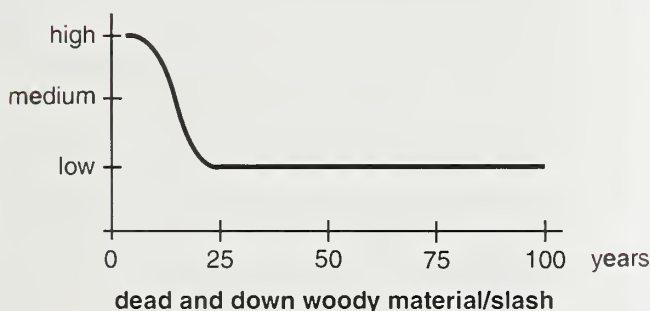
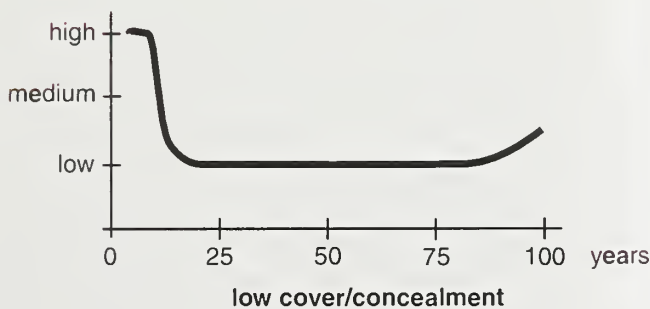
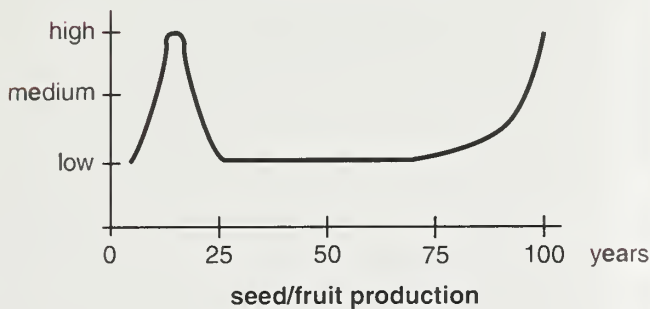
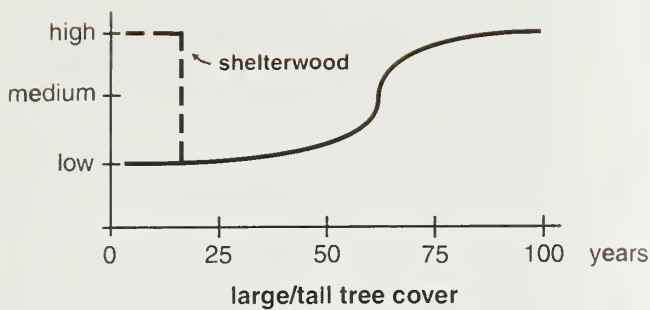
Even-aged Systems

As the name suggests, even-aged silvicultural systems produce stands where all the trees are the same age. Even-aged systems include shelterwood, seed-tree and clearcutting.

When walking through an even-aged forest you may see a mixture of trees of different sizes, but these trees are all the same age. There will be significant changes in the character of the canopy cover over the length of a rotation. Following a shelterwood or seed-tree cutting there will be some trees present. They will be widely spaced—from 30 to 60 feet apart—and similar in size. Following a clearcut no trees will remain, leaving a wide open area with no canopy. Following all three of these reproduction methods many new trees will begin to grow. During the first 10 to 15 years, there will be many small seedlings. Their foliage will be close to the ground and difficult to walk through. Then during the second period, from about 20 to 30 years, the trees thin out from competition and a layer of foliage rises above the ground, high enough so you can walk under it. As the forest continues to mature the canopy rises high overhead. Your view in the forest becomes fairly open, composed of tree trunks and perhaps patches of herbs and forbs on the ground.

When comparing the graphs on the left to those shown for the uneven-aged systems you will see that the interaction between wildlife habitat and visual quality attributes will be spread out over a long period of time.

Keep in mind that the time between regeneration cuttings for even-aged systems can be from 60 to 100 years. While it may take 15 to 20 years for the forest to regain its visual appearance, there will be a long time to enjoy the forest before it will need another treatment to regenerate the mature trees.



Glossary

aesthetics 1. The theory or understanding of the perception of the environment by all the senses. 2. The science or study of beauty.

canopy The continuous cover of branches and foliage formed by the crown of trees.

dead and down woody material Any dead branches, tree trunks, or stumps that are on the ground.

even-aged system A planned sequence of silvicultural treatments designed to maintain and regenerate a forest stand with one age class.

forest A plant community characterized by trees and other woody vegetation growing, more or less, closely together.

forest benefit Any of the things that you receive from a plant community dominated by trees that increases the community's value to you. These things may include beauty, solitude, biological diversity, habitats for species of special concern, water quality or quantity, wildlife, wood products, and income.

forest stand A community of trees growing together. The trees are sufficiently uniform in spacing, condition, age arrangement, and/or forest cover type to distinguish it from neighboring stands. The conditions of the site are relatively uniform, including soil properties, slope, water drainage, exposure to weather, and productivity. Stands can be any size or shape, but they must be contiguous.

forest stewardship The wise management and use of resources to ensure their health and productivity for the future with regards to generations to come.

herbaceous plants Plants with non-woody stems growing in forest understories.

mast tree A tree that produces nutlike fruits such as acorns, beechnuts, hickory nuts, seeds of certain pines, cherries, and apples.

plant community A naturally occurring collection of plants and animals with similar needs for sunlight, warmth, moisture, shelter, and nutrients growing together. They function together to cycle energy, nutrients, and water.

regeneration or reproduction method

A treatment within a silvicultural system by which a new age class is established.

rotation The time from the establishment of an even-aged stand until its maturity.

silvicultural treatment A process or action that can be applied in a controlled manner according to the requirements of a prescription or plan for a forest community to improve real or potential benefits.

slash Branches, twigs, and leaves of trees left on the ground after a treatment.

snag A standing dead tree without branches, or the standing portion of a broken-off tree. Snags may provide feeding and/or nesting sites for wildlife.

understory The small trees, shrubs, and other vegetation growing beneath the canopy of forest trees and above the herbaceous plants on the forest floor.

uneven-aged system A planned sequence of treatments designed to maintain and regenerate a forest stand with three or more age classes.

wildlife habitat The combination of factors, such as food, water, cover, and spatial needs required by wildlife to survive and reproduce in a given area. Each species has unique habitat requirements.



NED: a Set of Decision-Support Tools for Resource Management

NED is a collection of software products intended to help resource managers develop goals, assess current and future conditions, and produce sustainable management plans for forest properties. The software tools are being developed by the USDA Forest Service, Northeastern Research Station. The **NED** project is coordinated by the research work unit at the George D. Aiken Forestry Sciences Laboratory in Burlington, Vermont, in cooperation with other research units in the Northeastern, North Central, and Southern Research Stations. Many state and educational institutions also are working in conjunction with the Forest Service on this project. **NED** software can be downloaded free of charge from the internet at:

<http://www.fs.fed.us/ne/burlington/ned>

FOREST STEWARDSHIP PLANNING GUIDE

Published 1995

The primary purpose of this guide is to provide landowners, students, and the public with exposure to and explanations of a wide range of forest practices used to produce a variety of benefits from forests. The first step is to determine what goals the forest owner has for the forest. The program offers a great deal of basic information about forests and their management, along with menus of possible stewardship goals. This program makes limited recommendations on how to manage a forest for specific goals and describes the conditions that must be created or enhanced to accomplish them.

NEWILD

Published 1998

NEWILD is a computer program that presents expert knowledge about wildlife habitat requirements in the Northeast. The program enables users to gain information about wildlife habitat relationships and to make more informed decisions. The compilation of natural history and habitat information for the inland (non-marine) wildlife can aid foresters and wildlife biologists in assessing the potential effects of proposed habitat management practices on wildlife species.

NED/SIPS

Published 1995

The Stand Inventory Processor and Simulator (SIPS) program provides an effective means of creating, managing, and analyzing forest inventory records at the stand level. Its user-friendly interface relieves the pain of entering and editing stand inventory data, and, once data are entered, a host of analytical tools are available to help understand the data. A variety of reports can be generated describing the vegetation structure, timber value, and economics of the stand. The user may apply any of a set of standard treatments to the stand or design a customized cutting scheme, and utilize one of the four incorporated stand growth simulators to show what the stand may look like in the future.

NED-1

Published 2000

NED-1 is a Windows program that emphasizes the analysis of forest inventory data from the perspective of the different forest resources. The resources addressed are aesthetics, ecology, forest health, timber, water, and wildlife. NED-1 evaluates to what degree individual stands, or the management unit as a whole, provide the conditions required to accomplish specific goals. An extensive hypertext system provides the user with information about resource goals, the desired conditions to achieve those goals, and the related data used to analyze the actual condition of the forest.

NED HEALTH

Release Date: 2000

NED-Health is another program that provides information on stress agents that affect the health of forest trees. These agents may include insects, fungi, weather, or people. Based on what trees are found in a particular forest, the program provides information on causes of damage, how to recognize the causes, and how to avoid or reduce damage.

Additional Reading

Listed below are some of the books and publications that will help you learn more about managing your forest land for multiple benefits.

Appleton, J. 1975. **The experience of landscape.** John Wiley, London, England. 293 pp.

Bell, S. 1993. **Elements of visual design in the landscape.** E&FN Spon, London, England. 212 pp.

DeGraaf, R. M. and D. D. Rudis. 1986. **New England wildlife: habitat, natural history, and distribution.** Gen. Tech. Rep. NE-108. Broomall, PA: USDA Forest Service, Northeastern Forest Experiment Station. 491 pp.

DeGraaf, R. M. and G. M. Witman. 1979. **Trees, shrubs, and vines for attracting birds: a manual for the northeast.** University of Massachusetts Press, Amherst, MA. 194 pp.

DeGraaf, R. M., M. Yamasaki, W. B. Leak, and J. W. Lanier. 1992. **New England wildlife: management of forested habitats.** Gen. Tech. Rep. NE-144. Radnor, PA: USDA Forest Service, Northeastern Forest Experiment Station. 271 pp.

Forestry Commission. 1991. **Community Woodland Design Guidelines.** HMSO, London, England. 49 pp.

Gill, G. D. and W. M. Healy. 1974. **Shrubs and vines for northeastern wildlife.** Gen. Tech. Rep. NE-9. Upper Darby, PA.: USDA Forest Service, Northeastern Forest Experiment Station. 180 pp.

Hunter, M. L., Jr. 1990. **Wildlife, forests, and forestry: principles of managing forests for biological diversity.** Prentice Hall. Englewood Cliffs, NJ. 370 pp.

Lucas, Oliver W.R. 1991. **The design of forest landscapes.** Oxford University Press, New York. 381 pp.

Martin, A. C., H. S. Zim, and A. L. Nelson. 1951. **American wildlife & plants: a guide to wildlife food habits.** Dover Publications, Inc., New York, NY. 500 pp.

Nyland, R. D. 1996. **Silviculture: concepts and applications.** The McGraw-Hill Companies, Inc., New York, NY. 633 pp.

Patton, D. R. 1992. **Wildlife habitat relationships in forested ecosystems.** Timber Press, Inc., Portland, OR. 392 pp.

Tubbs, C. H., R. M. DeGraaf, M. Yamasaki, and W. M. Healy. 1987. **Guide to wildlife tree management in New England northern hardwoods.** Gen. Tech. Rep. NE-118. USDA Forest Service, Northeastern Forest Experiment Station. 30 pp.



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